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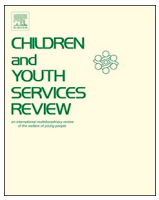

Mapping inequalities in school attendance: The relationship between dimensions of socioeconomic status and forms of school absence

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A B S T R A C T

In this article, we investigated whether and to what extent various dimensions of socioeconomic background (parental education, parental class, free school meal registration, housing status, and neighborhood deprivation) predict overall school absences and different reasons for absenteeism (truancy, sickness, family holidays and temporary exclusion) among 4,620 secondary school pupils in Scotland. Students were drawn from a sample of the Scottish Longitudinal Study comprising linked Census data and administrative school records. Using fractional logit models and logistic regressions, we found that all dimensions of socioeconomic background were uniquely linked to overall absences. Multiple measures of socioeconomic background were also associated with truancy, sickness-related absence, and temporary exclusion. Social housing and parental education had the most pervasive associations with school absences across all forms of absenteeism. Our findings highlight the need to consider the multidimensionality of socioeconomic background in policy and research decisions on school absenteeism. A more explicit focus on narrowing the socioeconomic gap in absenteeism is required to close the inequality gap in educational and post-school outcomes.

1. Introduction

School absenteeism is a pervasive problem in educational systems worldwide and has attracted much attention among researchers, media, and policymakers (Attendance Works, 2016; Gottfried & Hutt, 2019; Jordan & Miller, 2017; UK Department of Education, 2019). Being absent from school can be due to sickness, exclusion, truancy, or family holidays, with high costs for individuals and society (Reid, 2005). At the individual level, early school absenteeism and exclusion are strong predictors of subsequent poor attendance and exclusion (Alexander, Entwisle, & Kabbani, 2001; Bowman-Perrott et al., 2011). Higher rates of absenteeism are also associated with poor academic performance (e.g., Gottfried, 2010; Morrissey, Hutchison, & Winsler, 2014; Ready, 2010), school dropout (Balfanz, Herzog, & Mac Iver, 2007; Ou & Reynolds, 2008; Rumberger, 1995) and a lower likelihood of college enrolment (Balfanz & Byrnes, 2012). In the long term, school absenteeism is associated with substance abuse such as smoking, drinking, and taking drugs (Hallfors et al., 2002), running away from home (Tyler & Bersani, 2008), and a lower likelihood of employment (Alexander, Entwisle, & Horsey, 1997). At a societal level, persistent school absence is linked with increased risk of juvenile delinquency (Clark et al., 2003; Zhang, Katsiyannis, Barrett, & Willson, 2007; Mueller & Stoddard, 2006; McVie, 2006), severe criminal activities, violence, contacts with the legal system and imprisonment (Rodríguez & Conchas, 2009; Kearney, 2009; Skola & Williamson, 2012; Wolf & Kupchik, 2017).

When considering the determinants of school attendance, there is robust evidence suggesting an association between children's socioeconomic background and school absenteeism. A few studies provide mixed findings (e.g., Ingul, Klo, Silverman, & Hans, 2012; Rhoad-Drogalis & Justice, 2018) or suggest no relationship between socioeconomic background and absenteeism (e.g., Gottfried, 2015; Stempel, Cox-Martin, Bronsert, Dickinson, & Allison, 2017), but the majority of studies, mostly from a US context, found a strong association (e.g., Chen, Culhane, Metraux, Park, & Venable, 2016; Gennetian, Rodrigues, Hill, & Morris, 2018; Gottfried, 2014; Gottfried & Gee, 2017; Morrissey et al., 2014; Nolan, Cole, Wroughton, Clayton-Code, & Riffe, 2013). Specifically, students from lower socioeconomic backgrounds are overrepresented among those absent from school and have a higher risk of school absenteeism than those from more advantaged socioeconomic backgrounds. Evidence for an association between socioeconomic background and school absenteeism was also found in other countries such as Ireland (Darmody, Smyth, & Mccoy, 2008), the UK (Attwood & Croll, 2006), Australia (Hancock, Mitrou, Taylor, & Zubrick, 2018), and in a recent meta-analytic review on the risk factors of school absenteeism (Gubbels, van der Put, & Assink, 2019).

The pathways between family socioeconomic status (SES) and school absenteeism are multifaceted and complex. According to developmental theories, children from lower socioeconomic backgrounds face several individual and structural barriers that affect their developmental outcomes and subsequent educational experiences (Bourdieu,

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1977; Bronfenbrenner, 1993; Conger, Conger, & Martin, 2010; Mayer, 1997) such as absenteeism (Galster, 2012; Gottfried & Gee, 2017). Although research on the mechanisms by which family SES influences absenteeism is limited (Gee, 2018), empirical studies suggest that the consequences of living in socioeconomic disadvantage have, in turn, detrimental effects on children's school attendance. For instance, children from lower socioeconomic backgrounds are at a greater risk of developing *behavior problems* that are known risk antecedents of being absent or excluded from school (Classi, Milton, Ward, Sarsour, & Johnston, 2012; Corville-Smith, Ryan, Adams, & Dalicandro, 1998; Gubbels et al., 2019; Hemphill, Plenty, Herrenkohl, Toumbourou, & Catalano, 2014; Ingul et al., 2012). *Child and adolescent health* is another potential mediator for the relationship between socioeconomic background and school absenteeism. Studies have found associations between obesity (Rappaport, Daskalakis, & Andrel, 2011), asthma (Mizan, Shendell, & Rhoads, 2011; Moonie, Sterling, Figgs, & Castro, 2006), physical (Currie, 2009; Evans & Kim, 2007) and mental health problems (Richards & Hadwin, 2011; Burton, Marshal, & Chisolm, 2014; Wood et al., 2012), which are more prevalent in children and adolescents from lower socioeconomic backgrounds, and school absenteeism. Children's socioeconomic background is also associated with several other predictors of school absenteeism such as *substance abuse* (Engberg & Morral, 2006; Goodman & Huang, 2015), *frequent school transfers* (Alexander, Entwisle, & Dauber, 1996; Nolan et al., 2013), *exposure to environmental hazards* (Chen, Jennison, & Yang, 2002; Gilliland et al., 2001), *run-down school facilities* (Durán-Narucki, 2008), *reduced access to public transport* (Gottfried, 2017; Stein & Grigg, 2019) and *exposure to crime* (Burdick-Will, Stein, & Grigg, 2019).

However, several gaps in our understanding of the association between socioeconomic background and school absences remain. First, the overwhelming majority of studies used one measure of socioeconomic background (in many cases eligibility for free and reduced-price lunch in school) and assumed that different socioeconomic background measures are interchangeable when analyzing associations with school absences (for exceptions, see Gottfried, 2014, 2015; Rhoad-Drogalis & Justice, 2018; Sullivan, Klingbeil, & Van Nortnan, 2013). Evidence from studies of the association between socioeconomic background and developmental or educational outcomes (Bukodi & Goldthorpe, 2013; Schenck-Fontaine & Panico, 2019) suggests that different socioeconomic background components are likely to influence school absenteeism independently from each other and to a varying extent. For instance, Rhoad-Drogalis and Justice (2018) found that family income was associated with school attendance among preschool children, while parental education was not. Huang and Cornell (2018) showed that the receipt of free- and reduced-price lunch increased the risk of out-of-school suspension, but found no differences in this risk by parents' education. As a result, these socioeconomic indicators should be treated as diverse risk factors that underpin the reasons for missing school (Hancock et al., 2018). Neglecting critical dimensions of socioeconomic background may lead to underestimating the full scope of the relationship between socioeconomic background and school attendance.

Moreover, using single measures, or assuming that various socioeconomic background dimensions are interchangeable may prevent us from a deeper understanding of the different layers of social inequality in school absenteeism. We argue that it is important to disentangle the associations between different dimensions of socioeconomic background and school absenteeism because varying strengths of relationships provide insights into the mediating pathways between family socioeconomic circumstances and school absences. For instance, larger associations between family income and school absenteeism suggest that differences in economic resources may be the main drivers for children's school absences. In comparison, greater evidence for associations with parents' education hints at the role of cultural resources and parental involvement. Effects of neighborhood deprivation independent of family socioeconomic background will point towards environmental mechanisms beyond the nuclear family such as peer effects and role modeling (Gottfried, 2014).

Second, studies exploring the link between socioeconomic background and school absences focus on either overall measures of absenteeism or specific forms (e.g., truancy). They hardly address whether predictors, including socioeconomic background, vary in the extent to which they are associated with different reasons for being absent. The only study that investigated the association between socioeconomic status and more than one form of absenteeism found that lower family income is associated with both an increased risk of truancy and sickness-related absenteeism (Austin & Totaro, 2011). However, descriptive data from England suggest that while pupils eligible for free school meals (FSM) had greater absences due to unauthorized reasons, their non-FSM peers were more likely to be absent due to authorized reasons (UK Department of Education, 2011). These different socioeconomic risk profiles across the reasons for absence matter because unauthorised absences are more harmful to school performance than authorised absences (Gershenson, Jacknowitz, & Brannegan, 2017; Gottfried, 2009). Even rarer are studies exploring associations between different dimensions of socioeconomic background and forms of school absenteeism in a single study. Decisions about how key variables are measured and modelled can influence inferences about socioeconomic inequality in school absence (Dougherty, 2018). The impact of different dimensions of socioeconomic background on school absences may be smaller or larger, depending on the form of absenteeism. Considering both dimensions of socioeconomic background and forms of absenteeism will provide us with greater insights into why students from different family circumstances differ in their risk of school absences.

Third, intersectional perspectives (e.g., Codiroli Mcmaster & Cook, 2018) suggest that socioeconomic circumstances influence adolescents' life courses in conjunction with other individual and family characteristics. Consequently, the strength of the relationship between socioeconomic background and school absenteeism may vary depending upon students' sex (e.g., Attwood & Croll, 2006; Hemphill et al., 2014) or place of residence (Achilles, McLaughlin, & Croninger, 2007). Whereas there is literature on the associations of socioeconomic background, sex, and place of residence with school absenteeism, the question of whether socioeconomic inequalities in adolescents' school attendance differ across sex and place of residence has attracted much less attention.

Socioeconomic circumstances may be more detrimental to boys or girls, depending on the form of absenteeism considered. Generally, boys show more behavioral problems (e.g., Brooks-Gunn & Duncan, 1997; Mazza et al., 2017; Lawrence, Dawson, Houghton, Goodsell, & Sawyer, 2019), are more likely to be absent due to conduct problems (Lawrence et al., 2019), truancy (e.g., Attwood & Croll, 2006; Claes, Hooghe, & Reeskens, 2009; Veenstra, Lindenberg, Tinga, & Ormel, 2010) and suspension from school (e.g., Hemphill et al., 2014, Wallace, Goodkind, Wallace, & Bachman, 2008) than their female peers. Considering that behavioral problems are also stratified by socioeconomic conditions (Mazza et al., 2017), it is likely that truancy- and suspension-related absenteeism will be more detrimental to boys than girls from lower socioeconomic backgrounds. Parental input in boys versus girls may also vary across families from different socioeconomic backgrounds (Entwisle, Alexander, & Olson, 2007). These differences in quantity and quality of parental involvement across family socioeconomic backgrounds may affect boys' behavioral development more strongly than girls (Autor, Figlio, Karbownik, Roth, & Wasserman, 2016). It suggests that adverse family circumstances will have a stronger impact on behavior-related absences (truancy, exclusion) among boys than among girls.

On the other hand, adolescents' socioeconomic background may be more strongly related to absenteeism among girls than among boys due to a stronger prevalence of internalizing behavior and sickness. Internalizing mental health difficulties such as anxiety and depression are more common among adolescent girls than boys, and these

conditions are associated with a greater likelihood of absenteeism (Hancock et al., 2018; Lawrence et al., 2019; Finning, Ford, Moore, & Ukoumunne, 2020). As is the case for boys' externalizing problems, internalizing problems are equally influenced by socioeconomic conditions (Mazza et al., 2017). As a result, absences connected to internalizing behavior may be higher for girls than boys from lower socioeconomic backgrounds. Further, 'period poverty' – where girls cannot access sanitary products due to financial constraints (Plan International UK, 2017; WHO/UNICEF, 2012) – may increase school absenteeism among girls from lower socioeconomic backgrounds.

Research also suggests that urban schools tend to suspend more students than rural schools (Achilles et al., 2007). Students in urban areas are also more likely to be truant than students from rural areas (Darmody et al., 2008; Sheldon & Epstein, 2004). Chronic absenteeism is particularly pronounced among youth living in high poverty urban areas (Balfanz & Byrnes, 2012). As a result, many studies on the determinants of school absenteeism are focused entirely on urban settings (e.g., Chen et al., 2016; Gennetian et al., 2018; Rappaport et al., 2011; Sullivan et al., 2013). We hypothesize that the relationship between social background and school absenteeism varies across urban and rural settings. This is because rural areas are less exposed to crime, neighborhood problems (e.g., litter, graffiti), air pollution, or income deprivation and have a greater community sense than urban areas (Scottish Government, 2018). Therefore, these protective factors are likely to serve as a buffer against absenteeism for students from lower socioeconomic backgrounds in rural areas.

2. The current study

The current study aims to fill the research gaps mentioned above and to contribute to our understanding of the association between socioeconomic background and school attendance in several ways. First, our paper uses the Scottish Longitudinal Study linking Census data and administrative school records, allowing us to harness reliable and comprehensive socioeconomic background measures from the Census and school attendance measures from the administrative data. This data are unique in absenteeism research. They combine the advantages of survey information from the Census by using socioeconomic background measures that would otherwise be unavailable with the benefits of using administrative data, including detailed and more accurate measures of school absenteeism (Keppens, Spruyt, & Dockx, 2019).

Second, we investigate how different dimensions of socioeconomic background (parental social class, parental education, free school meal registration, housing status, and neighborhood deprivation) uniquely shape the risk of absences. Third, we consider both overall absenteeism and the different reasons for being absent from school (truancy, sickness-related absence, family holidays, and temporary exclusion) and explore how they are associated with different dimensions of socioeconomic background. Fourth, drawing on notions of intersectionality, we investigate whether sex and place of residence moderate the relationship between dimensions of socioeconomic background and forms of school absenteeism.

No empirical studies in the field of absenteeism research have examined these nuances of the relationship between socioeconomic background and school absenteeism in this detail. Advancing our knowledge of the association between dimensions of socioeconomic status and forms of school absence will provide a more holistic picture of the different layers of social inequality in school absenteeism. As argued above, such knowledge will also provide a conceptual understanding of possible mediating pathways between family socioeconomic conditions and school absences. Additionally, findings will highlight the importance of measurement decisions on key inferences relating to socioeconomic inequality in school absence, with significant relevance for researchers, policymakers, and practitioners. From a policy and practical perspective, knowing which aspects of children's socioeconomic background are (more strongly) associated with particular reasons for absenteeism will help improve targeted interventions to reduce school absenteeism.

2.1. Research questions

In summary, the current study aims to understand the nature of socioeconomic inequalities in school attendance among adolescents and asks the following research questions:

1. Do patterns of absenteeism differ by the dimensions of socioeconomic background measured (parental education, parental class, free school meal registration, neighborhood deprivation, housing status)?
2. Are there differences in the association between dimensions of socioeconomic background and forms of school absenteeism in Scotland (sickness absence, family holidays, truancy, temporary exclusion)?
3. Do sex and place of residence moderate the relationship between dimensions of socioeconomic background and forms of absenteeism?

3. Methods

3.1. Data and analysis

This research uses data from the Scottish Longitudinal Study (SLS), which is a large-scale anonymized record linkage study in Scotland. The SLS covers 5.3% of the Scottish population, selected by using 20 semi-random birthdates. Data can be linked from current statistical and administrative sources such as national Census data (1991, 2001, 2011), vital events data, the National Health Service (NHS) central register data, or school education data (2007–2013).

Our SLS sub-sample consists of two cohorts of SLS members who were in their final year of compulsory schooling (S4) in state-funded schools in 2007 and 2008, respectively (n = 6,031). At this stage, almost all students in Scotland undertake high stakes examinations, which strongly determine their future educational and labor market pathways (Iannelli & Duta, 2018). In this paper, we used information from the Census 2001 data on these SLS members and their parents' socioeconomic characteristics, information from the School Census and their attendance data from the years 2007 and 2008.

We excluded students who attended special schools, those recorded to have repeated a school year, and those who appeared to have skipped a consecutive school stage from our analytic sample (n = 62). These groups may differ systematically from the majority regarding social characteristics and school attendance. Students who were not present (n = 812) or who did not live with their parents (n = 214) during the 2001 national Census were also not included in our sample. We also excluded students due to non-response (missing/edited) on any of the variables used (n = 323). The most common variables affected by non-response (missing/edited) were parental class, education, and mother's age. Our final sample, therefore, consists of 4,620 students.

We obtained ethical approval for the study from the University of Strathclyde ethics committee. The SLS Research Board gave their approval for the use of SLS data for the project 2018_007. All analyses took place in a Safe Setting Place following established protocols set up by the data holders for the safe use of the data for research purposes (SLS-DSU, n.d.).

2.2. Variables

Our dependent variable consists of overall absenteeism as well as specific reasons for being absent from school (sickness-related absence, family holidays, truancy, temporary exclusion). To capture the different dimensions of socioeconomic background, we considered parental education, parental class, free school meal registration, housing tenure,

and neighborhood deprivation. We used Cramer's V to calculate correlation coefficients to assess potential multicollinearity among our dimensions of socioeconomic background. Our dimensions of socioeconomic background are correlated, but they are not multicollinear. The average correlation among all dimensions of socioeconomic background was 0.34 (Min = 0.22; Max = 0.49). The full correlation matrix is presented in the Supplementary Material (Table S1)

2.2.1. Overall absenteeism

Overall absenteeism was measured as the proportion of half-days a pupil was absent from school in their final year of compulsory schooling, regardless of the reason for being absent. Students in Scotland attend school for half a day (commonly eight 40-minute sessions with breaks; 27 h per week). The total number of half-days attended includes attendance in school, educational visits organized by the school, other attendance out of school, medical and dental appointments lasting less than half of a school opening day. To account for differences in the number of possible half-days between different school authorities and students, we divided the total number of half-days attended by the total number of possible half-days for each student in a given school authority. We subtracted the resulting proportion from one to obtain the proportion of overall absenteeism. On average, the proportion of half-days students missed in the final year of compulsory schooling was 14 percent (Mean = 0.14; SD = 0.13).

2.2.2. Sickness-related absenteeism

Sickness-related absence refers to the proportion of half-days, a pupil was absent from class due to sickness and for which no alternative educational arrangement was provided. This includes any time where a pupil is off sick, with proof of illness such as a parental letter or medical certificate. On average, the percentage of half-days students missed school due to sickness absence in the final year of compulsory schooling was five percent (Mean = 0.05; SD = 0.07).

2.2.3. Family holidays

Absence due to family holidays is a binary variable indicating whether families have taken their children out of school to go on holidays (including authorized and unauthorized) at least once during the final year of compulsory schooling (1) or not (0). The percentage of adolescents that were taken out of school due to family holidays was 15 percent.

2.2.4. Truancy

Truancy measures the proportion of half-days a student was absent and for which the student did not provide an adequate explanation. On average, the percentage of half-days students missed due to truancy in the final year of compulsory schooling was two percent (Mean = 0.02; SD = 0.05).

2.2.5. Temporary exclusion

Temporary exclusion refers to a situation in which a student is suspended from school for a fixed period. It was measured as a binary variable indicating whether a student had ever been excluded (1) or not excluded (0) during the school year. The percentage of students that were temporarily suspended from school at least once in the final year of compulsory schooling was five percent.

2.2.6. Parental education

Parental education was measured using the highest educational qualification among parents, or the educational qualification of the present parent in single-parent households at the Census 2001. It was measured with five categories: (1) No qualification (14%); (2) Lower secondary qualification (Standard Grade/GCSE or equivalent) (31%); (3) Upper secondary qualification (Higher Grade/A-levels or equivalent) (18%); (4) College below degree (HNC/HND or equivalent) (11%); and (5) First degree/Higher degree or equivalent (27%). Highly educated parents have detailed formal and informal knowledge of the education system and are more aware of the benefits of education for future life course outcomes. As a result, highly educated parents tend to be more involved in their children's schooling (e.g. Jeynes, 2005) which, in turn, lowers their risk of being absent from school (Epstein & Sheldon, 2002).

2.2.7. Parental class

We measured parental social class using the 5-class 'analytical' version of the National Statistics Socioeconomic Classification (NS-SEC) (Goldthorpe & McKnight, 2006) based on employment characteristics in the Census 2001. The specific class categories in our study were: (1) Higher managerial, administrative and professional occupations (41%), (2) Intermediate occupations (15%), (3) Small employers and own account workers (7%), (4) Lower supervisory and technical occupations (9%), (5) Semi-routine and routine occupations (27%). We used the highest class among both parents and, in the case of single-parent households, the class of the present parent. Parents' class position captures differences in employment relations that are associated with advantages and disadvantages in income security, short-term income stability, and longer time income prospects (Goldthorpe & McKnight, 2006). Economic stability may reduce family stress, which is associated with risk antecedents of school absenteeism (Classi et al., 2012; Gubbels et al., 2019; Hemphill et al., 2014; Ingul et al., 2012).

2.2.8. Free school meal registration

Free school meal (FSM) registration was measured as a binary variable indicating whether a student was registered as entitled to free school meals (1) or not (0) during the final year of secondary schooling. This information was taken from the School Census. In 2007/2008, students entitled to free school meals were living in families who received Income Support (IS) or Income-based Job Seekers Allowance (IBJSA). Students with parents or carers who received Child Tax Credit, who did not receive Working Tax Credit, and had an annual income of below £14,155 were also entitled to FSM. FSM eligibility identifies students currently living in low-income and out-of-work households (Hobbs & Vignoles, 2010). It is a marker of current hardship that has immediate negative consequences for health and living conditions, which may lead to lower school attendance among children. However, not all students who may be eligible for free school meals are registered (McKendrick et al., 2019). In our analytical sample, nine percent of students were registered for free school meals.

2.2.9. Housing tenure

We measured housing tenure using information from the 2001 Census to indicate whether students were living in socially rented accommodation (1) or in an owner-occupied or privately rented accommodation (0). Families living in social housing are more likely to be relatively poor than families living in other forms of housing tenure (Tunstall et al., 2013). Social housing is also a risk factor for falling into poverty in the future (Jenkins, 2011). Although social housing is aimed at providing low-income families with better accommodation, some studies suggest that they lead to residential segregation and a higher concentration of families living in poverty (Newman, 2008). In our analytical sample, 28 percent of students lived in social housing in the Census 2001.

2.2.10. Neighborhood deprivation

Neighborhood deprivation was measured using the Scottish Index of Multiple Deprivation (SIMD) from the 2001 Census. The SIMD ranks 6,505 small areas, each containing around 350 households from most deprived to least deprived according to seven life course domains (employment; income; health; education, skills, and training; geographic access to services; crime; housing). For the current study, we used SIMD quintiles ranging from most deprived (SIMD 1) to least deprived (SIMD 5) neighborhood (% SIMD 1 = 21; % SIMD 2 = 20; %

Table 1
Summary Statistics (n = 4,620).

	Mean/Proportion	SD
Overall absenteeism	0.14	0.07
Sickness-related absenteeism	0.05	0.07
Family holidays	0.15	
Truancy	0.02	0.05
Temporary exclusion	0.05	
Parental education		
No qualification	0.14	
Lower secondary qualification	0.31	
Upper secondary qualification	0.18	
College below degree	0.11	
First degree/Higher degree	0.27	
Parental class		
Higher managerial, administrative and professional occupations	0.41	
Intermediate occupations	0.15	
Small employers and own account workers	0.07	
Lower supervisory and technical occupations	0.09	
Semi-routine and routine occupations	0.27	
Free school meal registration		
Yes	0.09	
No	0.91	
Housing tenure		
Social rented	0.28	
Private rented/owned	0.72	
Scottish Index of Multiple Deprivation		
SIMD 1 (most deprived)	0.21	
SIMD 2	0.20	
SIMD 3	0.22	
SIMD 4	0.19	
SIMD 5 (least deprived)	0.18	
Sex		
Female	0.47	
Male	0.53	
Place of residence		
Urban	0.78	
Rural	0.22	
Ethnicity		
"White"	0.97	
"Other ethnic background"	0.03	
Child's age at school stage S3	14.06	0.28
Mother's age at birth	27.85	5.03
School cohort in final year of secondary schooling		
2007	0.50	
2008	0.50	

Source. Scottish Longitudinal Study, own calculations.

SIMD 3 = 22; % SIMD 4 = 19; % SIMD 5 = 18%). Neighborhood conditions are associated with differences in exposure to environmental hazards, poor access to public transport and exposure to crime, which are known risk factors for school absenteeism (Burdick-Will et al., 2019; Chen et al., 2002; Stein & Grigg, 2019).

2.2.11. Confounders

We adjust our multivariable analysis with the following confounders: student sex (53% boys; 47% girls), place of residence (22% rural; 78% urban), ethnicity derived from parental information (97% "White"; 3% "Other ethnic background"), the child's age at school stage S3 (Mean = 14.06 years; SD = 0.28), mothers' age at birth of the pupil (Mean = 27.85 years; SD = 5.03). Since data were used from two school cohorts in the final year of compulsory schooling (50% 2007 cohort; 50% 2008 cohort), we controlled for this in all analyses. Table 1 summarizes the descriptive statistics of all our variables.

2.3. Analytic strategy

We used fractional logit models to analyze the association between our five socioeconomic dimensions and overall absenteeism, sickness-related absenteeism, and truancy. Fractional response models allowed us to analyze dependent variables that are measured as proportions, i.e., they include values between zero and one (Papke & Wooldridge, 1996). Regarding our binary dependent variables of temporary exclusion and family holidays, we used logistic regressions. Estimates are shown as average marginal effects (AMEs) indicating average differences in the rate of absenteeism overall, sickness-related absences, and truancy or in the risk of temporary exclusion and family holidays holding confounders constant. AMEs can be interpreted as percentage point differences in the rate or probability of the outcome when multiplied by 100. Other than logit coefficients, they allow for comparison of estimates across different groups, in our case, sex and place of residence (Mood, 2010). To account for the nested nature of the data (pupils within schools), we clustered standard errors at the school level.

We analyzed all dimensions of socioeconomic background (neighborhood deprivation, parental education, parental class, FSM registration, housing tenure) simultaneously when predicting the different forms of absenteeism (overall absenteeism, sickness-related absenteeism, family holidays, truancy, and temporary exclusion). To assess the moderating role of these variables on the relationship between dimensions of socioeconomic background and forms of school absenteeism, we also stratified our analysis by sex and place of residence. Our findings are presented as coefficient plots for ease of comparison of coefficients. It also allowed us to directly compare estimates for the dimensions of socioeconomic background across moderators. Full regression outputs, including all confounders, can be found in the Supplementary Material (Tables S2-S6).

3. Results

3.1. Socioeconomic background and overall absenteeism

All of the socioeconomic dimensions investigated in this study (neighborhood deprivation, parental education, social class, housing tenure, and FSM registration) were uniquely associated with overall absenteeism. Adolescents from more deprived areas, living in socially rented housing, coming from households with lower levels of parental education and social class, and registered for FSM were more frequently absent from school than their peers from more advantaged backgrounds. Only adolescents closer to the highest socioeconomic group in the neighborhood, education, and class categories did not differ significantly from the reference group (i.e., highest socioeconomic group). As seen in Fig. 1 (left-hand graph), the average marginal effects (AMEs) for our dimensions of socioeconomic background and overall absenteeism were largest for adolescents from socially rented households (AME = 0.043, SE = 0.005), households with no qualifications (AME = 0.041, SE = 0.008), registered for FSM (AME = 0.037, SE = 0.008), growing up in the most deprived area (AME = 0.029, SE = 0.007), and households with routine or semi-routine occupations (AME = 0.020, SE = 0.006).

Regarding our covariates of interest (see Table S2 in the Supplementary Material), girls were more frequently absent from school compared to boys (AME = 0.011, SE = 0.0004), and adolescents from rural areas had lower levels of overall absenteeism in comparison to their urban peers (AME = -0.022, SE = 0.005). Analyses stratified by sex showed similar patterns in the association between dimensions of socioeconomic background and school absenteeism among girls and boys (middle graph in Fig. 1). The association between socioeconomic indicators and overall school absenteeism was also similar for adolescents growing up in urban and rural areas (right-hand graph in Fig. 1). In tendency, living in socially rented housing seems to have a stronger association with overall absenteeism for adolescents growing up in urban areas compared to those growing up in rural areas (AME = 0.048; SE = 0.005 vs. AME = 0.024, SE = 0.010).

3.2. Socioeconomic background and sickness-related absence

Fig. 2 (left-hand graph) indicates the relationship between our

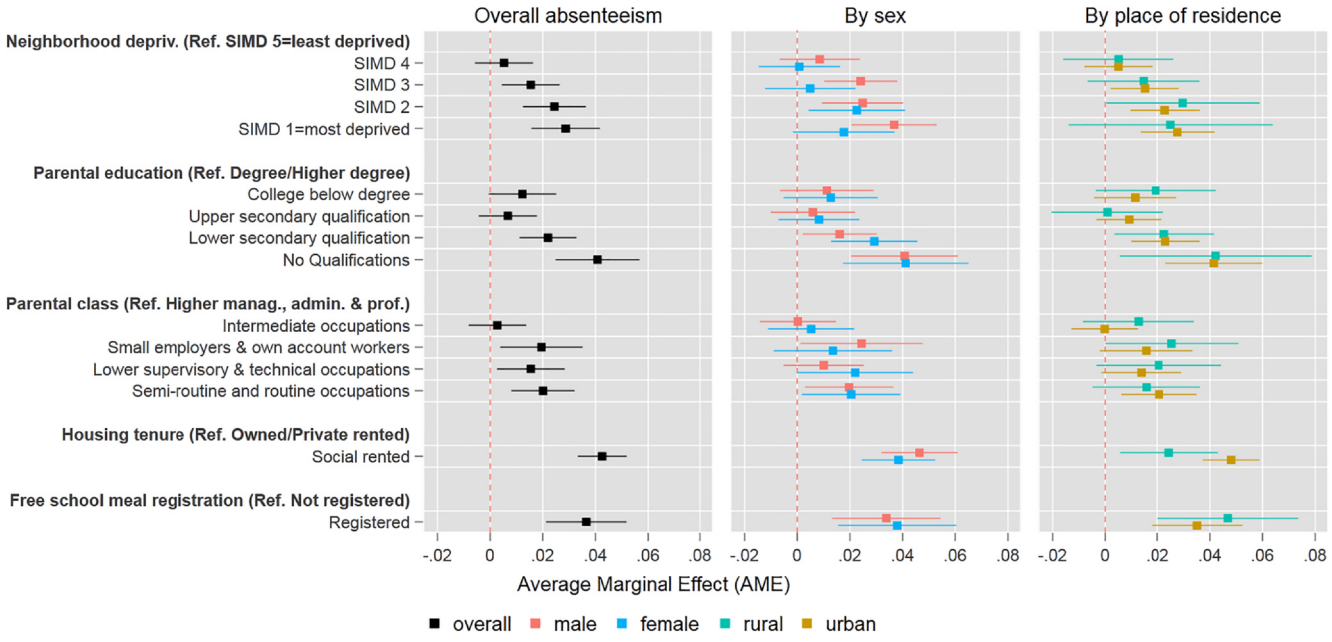

Fig. 1. Associations between dimensions of socioeconomic background and overall absenteeism (with 95% confidence intervals). *Source.* Scottish Longitudinal Study, own calculations.

dimensions of socioeconomic background and sickness-related absenteeism. Only parental education, housing tenure, and FSM registration were more strongly associated with sickness absenteeism. Higher rates of sickness absenteeism were reported for adolescents from households with lower parental education (AME = 0.013, SE = 0.003 for lower secondary qualification; AME = 0.015, SE = 0.005 for no qualifications). Adolescents living in socially rented accommodations (AME = 0.017, SE = 0.003) and those registered for FSM (AME = 0.011; SE = 0.004) also had a higher level of sickness-related absenteeism. Neighborhood deprivation and parental social class were no strong predictors of sickness-related absenteeism.

Regarding our moderators (see Table S3 in the Supplementary Material), girls had significantly higher levels of sickness absenteeism in comparison to boys (AME = 0.011, SE = 0.002), and there were no differences in the rate of sickness absenteeism between adolescents growing up in urban and rural areas (AME = 0.000, SE = 0.003).

Fig. 2 (middle and right-hand graph) shows that the association between the socioeconomic indicators and sickness absenteeism was similar for boys and girls, as well as for adolescents growing up in rural and urban areas. There were two exceptions to these patterns. Regarding sex differences, FSM registration was more strongly associated with sickness absenteeism among girls than among boys (AME = 0.015, SE = 0.006 vs. AME = 0.006; SE = 0.006). As with overall absenteeism, adolescents living in socially rented housing were more likely to be absent due to sickness in urban areas than their peers in rural areas (AME = 0.020; SE = 0.004 vs. AME = 0.007,

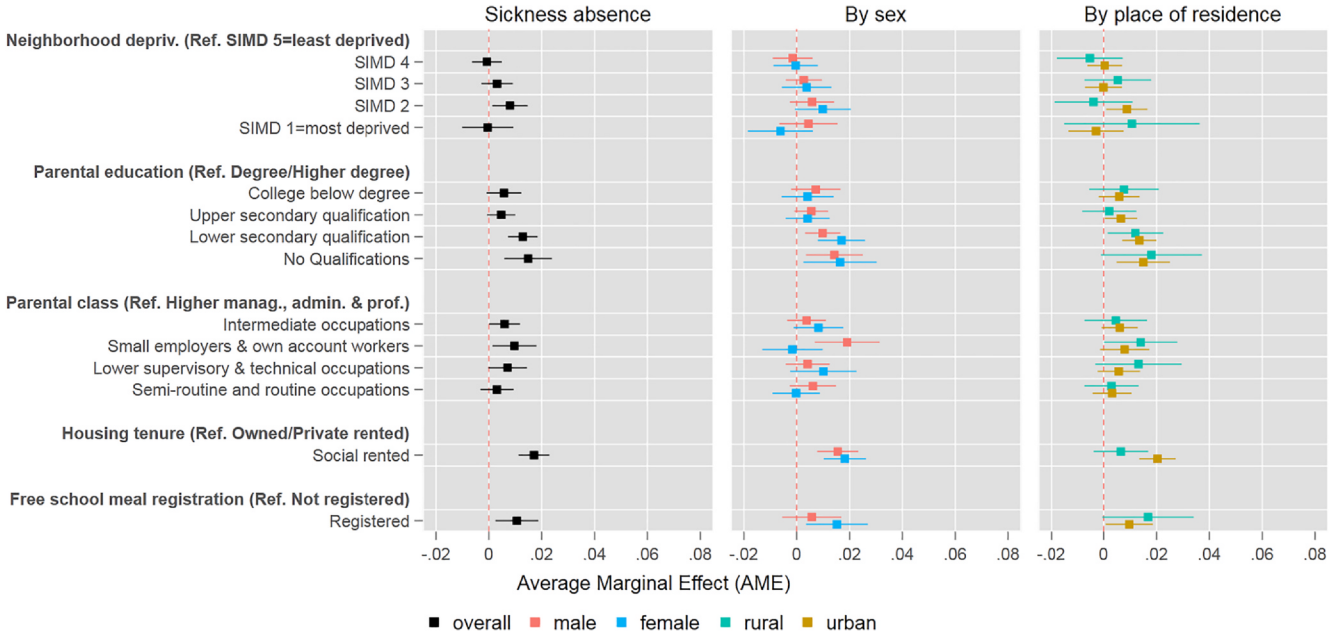

Fig. 2. Associations between dimensions of socioeconomic background and sickness-related absenteeism (with 95% confidence intervals). *Source.* Scottish Longitudinal Study, own calculations.

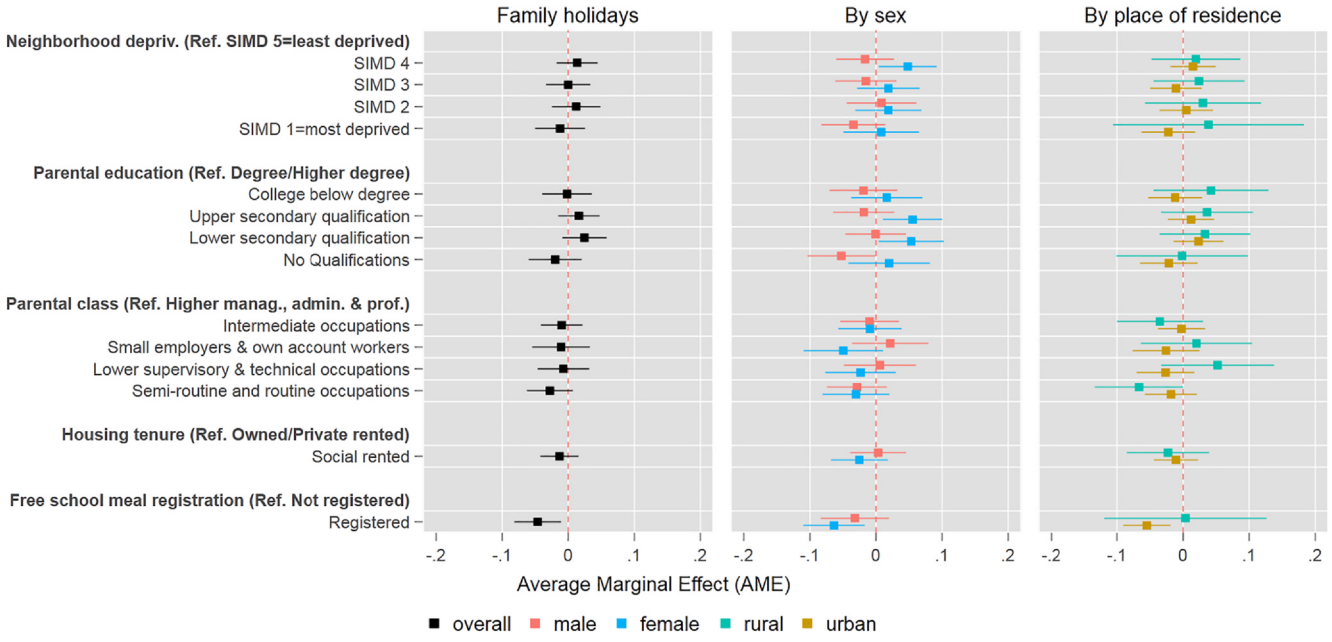

Fig. 3. Associations between dimensions of socioeconomic background and absenteeism due to family holidays (with 95% confidence intervals). *Source.* Scottish Longitudinal Study, own calculations.

SE = 0.005).

3.3. Socioeconomic background and absences due to family holidays

Fig. 3 shows that absences due to family holidays are not stratified by socioeconomic background. Aside from FSM registration, none of our indicators were strongly related to missing out on school due to family holidays. Adolescents on FSM registration were less likely to be absent due to family holidays than their peers not registered for FSM (AME = -0.046, SE = 0.018). The coefficients for the main effects of the moderators can be found in the Supplementary Material Table S4. While families decided more often to take girls on term-time holidays than boys (AME = 0.025, SE = 0.011), there was no difference between families in rural and urban areas in their probability of going on holidays during the school year (AME = 0.001, SE = 0.015). As shown in the middle and right-hand graph of Fig. 3, sex and place of residence did not moderate the relationship between our dimensions of socioeconomic background and absences due to family holidays in any consistent or considerable way.

3.4. Socioeconomic background and truancy

Fig. 4 (left-hand graph) depicts the relationship between socioeconomic background and truancy. Only parental education, parental class, and housing tenure were more strongly associated with truancy. Adolescents whose parents had no qualifications were more frequently truant than adolescents whose parents had a first degree (AME = 0.009; SE = 0.004). Adolescents whose parents work in semi-routine and routine occupations had higher levels of truancy than their peers with parents in professional and managerial occupations (AME = 0.007, SE = 0.003). For both parental education and class, the intermediate categories were not much different from the reference group. Adolescents growing up in socially rented housing were also more frequently truant than their peers growing up in owned or privately rented accommodations (AME = 0.008, SE = 0.002).

The coefficients for the main effects of the moderators of sex and place of residence on truancy can be found in Table S5 in the Supplementary Material. There were no greater sex differences in the extent of truancy (AME = 0.003, SE = 0.002). Also, adolescents from rural and urban areas did not differ significantly in the rate of truancy (AME = -0.003, SE = 0.002). Fig. 4 (middle and left-hand graph) shows that the association between our socioeconomic dimensions and truancy was similar for males and females, as well as for adolescents growing up in rural and urban areas.

3.5. Socioeconomic background and temporary exclusion

When looking at temporary exclusion (left-hand graph in Fig. 5), we found that living in deprived areas, having parents with no qualifications, being registered for FSM, and growing up in socially rented housing substantially increases the risk of being temporarily excluded from school. Being registered for FSM was the strongest predictor of temporary exclusion. Adolescents that are registered for free school meals had a higher probability of being temporarily excluded (4.1 percentage points) than peers not registered for FSM (AME = 0.041, SE = 0.014). Having parents with no qualifications increased the risk of temporary exclusion by 3.4 percentage points (AME = 0.034, SE = 0.014). Growing up in social housing or in more deprived areas increased the risk of temporary exclusion by more than two percentage points (AME = 0.020, SE = 0.009 for social housing; AME = 0.021, SE = 0.010 for SIMD 3; AME = 0.028, SE = 0.011 for SIMD 2; AME = 0.024, SE = 0.012 for SIMD 1). Adolescents whose parents are employed in lower supervisory and technical occupations had a risk that is 3.7 percentage points higher than those having parents from professional and managerial occupations (AME = 0.037, SE = 0.014). Apart from this exception, social class was a weaker predictor of temporary exclusion.

As shown in Table S6 in the Supplementary Material, girls had a lower probability of being excluded from school than boys (AME = -0.054, SE = 0.0006), while no meaningful differences in exclusion among adolescents growing up in urban and rural areas exist (AME = 0.001, SE = 0.008). There were some differences in the pattern of association between our socioeconomic dimensions and temporary exclusion by sex. There was, for instance, a tendency for neighborhood deprivation (e.g. AME = 0.044, SE = 0.020 vs. AME = 0.002, SE = 0.013 for SIMD 1), parents with no qualifications (AME = 0.057, SE = 0.022 vs. AME = 0.007, SE = 0.013), and FSM registration (AME = 0.054, SE = 0.022 vs. AME = 0.028, SE = 0.013)

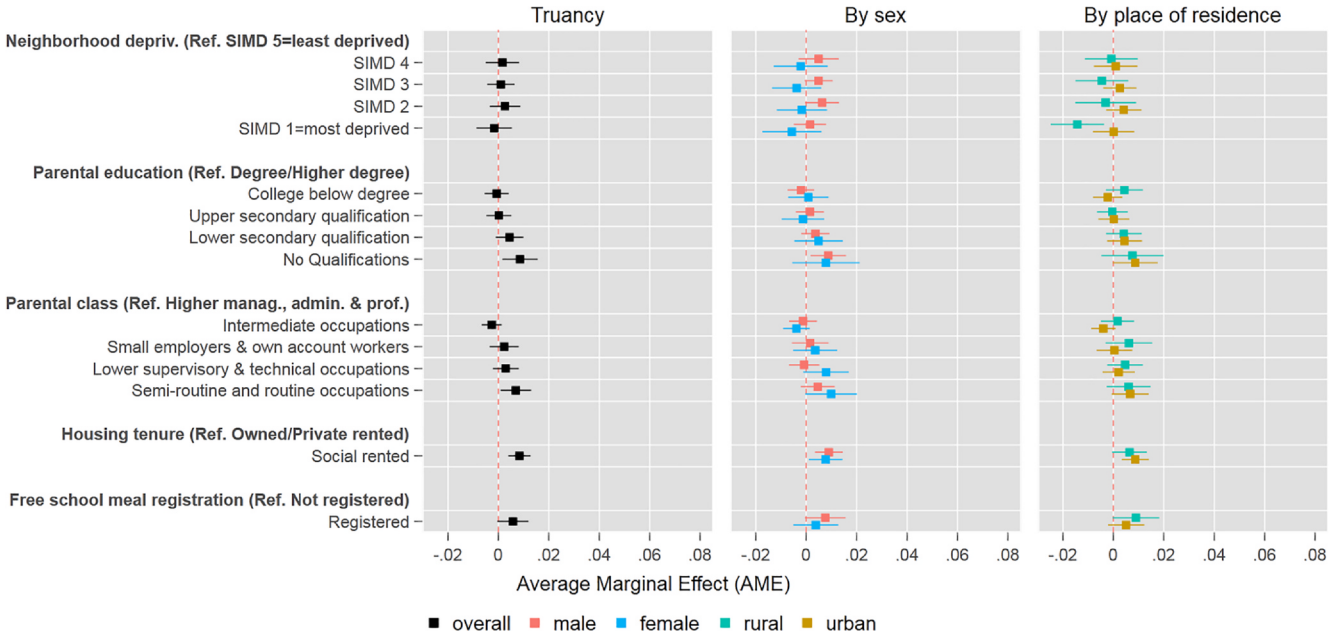

Fig. 4. Associations between dimensions of socioeconomic background and truancy (with 95% confidence intervals). *Source.* Scottish Longitudinal Study, own calculations.

to be more strongly associated with the risk of temporary exclusion among boys than among girls (Fig. 5, middle graph). Analyses stratified by place of residence suggest similar patterns in the association between socioeconomic indicators and temporary exclusion (Fig. 5, right-hand graph).

4. Discussion

This article investigated the association between socioeconomic background and school absences among pupils in their final year of compulsory secondary schooling in Scotland. We used a unique nationally representative dataset that combines information from Census data with administrative school records. Our study contributes new evidence on socioeconomic inequalities in school attendance by focusing on a country outside of the commonly considered context. Additionally, most previous research used a single measure of socioeconomic background in their analysis and ignored the multidimensional nature of family background. We advance the knowledge in the field by exploring the extent to which different dimensions of socioeconomic background (parental social class, parental education, free school meal registration, housing status, and neighborhood deprivation) were associated with school absences. Further, while previous studies focus on either overall absenteeism or a specific form of absenteeism (e.g., truancy), we looked at several different reasons for being absent from school and their associations with dimensions of socioeconomic background. Finally, we analyzed whether sex and place

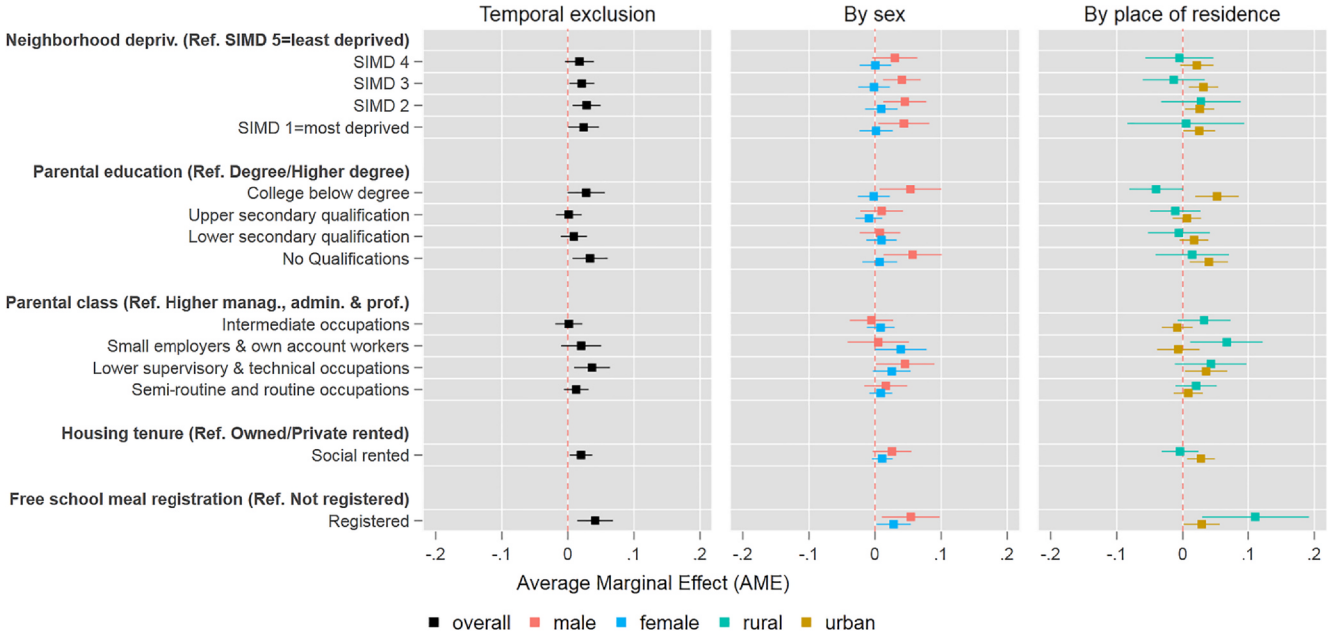

Fig. 5. Associations between dimensions of socioeconomic background and tempory exclusion (with 95% confidence intervals). *Source.* Scottish Longitudinal Study, own calculations.

of residence moderated the link between socioeconomic background and school absenteeism.

The results confirm previous studies showing that the socioeconmic background is a significant predictor of being absent from school (e.g., Gennetian et al., 2018; Gottfried & Gee, 2017; Morrissey et al., 2014). Our study's unique finding is that all dimensions of socioeconomic background, including neighborhood deprivation, are independently associated with overall absenteeism. In line with emerging evidence in other areas (Bukodi & Goldthorpe, 2013; Schenck-Fontaine & Panico, 2019), our findings demonstrate that focusing on a single measure of socioeconomic background can lead to an underestimation of the full scope of socioeconomic inequality in school absenteeism.

Apart from family holidays, specific forms of absenteeism were associated with multiple socioeconomic background measures, suggesting that each socioeconomic indicator is a key risk antecedent for a diversity of reasons for school absence. The importance of each socioeconomic background indicator in this study appears to depend on the particular form of absenteeism. However, housing tenure and parental education were consistently associated with sickness-related absences, truancy, and temporary exclusion. In other words, while there are multiple socioeconomic pathways to school absenteeism, the most consistent pathways are those that emanate from lower parental education and living in social rented housing. In terms of understanding mechanisms for these associations, evidence from sociological theories on the role of parental education suggests the importance of parental cultural capital (Bourdieu, 1977), while social housing hints at pathways via health, neighborhood, or financial stressors (Conger et al., 2010; Gottfried, 2014). Thus, it seems essential to consider multiple socioeconomic characteristics since selecting one over the other may influence whether one finds a strong between socioeconomic background and school absenteeism. To fully understand the association between socioeconomic background and school attendance, research has to consider the multidimensionality of socioeconomic background and the reasons for being absent from school.

We also examined whether sex and place of residence moderated the relationship between socioeconomic background and school absenteeism. Overall, the association between the dimensions of socioeconomic background and school absenteeism did not vary considerably between boys and girls. However, there were a few exceptions in line with expectations. For sickness-related absenteeism, we found that FSM registration was more strongly associated with being absent from school among girls than among boys. For temporary exclusion, there was a tendency for boys living in deprived areas and on FSM registration to be more at risk of being excluded than girls growing up in the same conditions. Dimensions indicative of a family's economic conditions (FSM registration) are likely to drive greater sickness-related absence among girls (e.g., Hancock et al., 2018) while those indicative of neighborhood and peer influence (SIMD) are more likely to affect boys' behavior-related absenteeism (e.g., Lawrence et al., 2019). Our results hint at possible complex intersectional associations among adolescents' socioeconomic conditions, sex, and school absenteeism that require further scrutiny.

There were generally no differences in the association between socioeconomic background and school attendance between urban and rural areas. We expected this relationship to be stronger in urban than in rural areas. The only exception we found is socially rented housing, which appears to have a more detrimental impact on overall absenteeism and sickness-related absence in urban than in rural areas. While these associations are not strong and pervasive enough to confirm our theoretical assumptions, more work is needed to understand the intersectional role of socioeconomic background, sex, and place of residence in shaping school attendance.

The paper has several *limitations* that we need to acknowledge when interpreting the results. First, all socioeconomic background measures except FSM registration are derived from household information from the Census 2001 and may have changed by the time school attendance is measured in 2007 and 2008. However, we are confident that the measures used are relatively stable over time. For instance, we compared the 2001 Scottish Index of Multiple Deprivation with the measure from 2006 and found a strong correlation (0.80). Parental class position is also more stable across the life course than family income (Goldthorpe & McKnight, 2006).

Second, it was not possible to determine from the data when precisely students were absent during the school year. Socioeconomic inequalities in school absenteeism may be more or less pronounced depending on the timing of absenteeism. Recent research has shown that missing days and months leading up to examinations have the most severe impact on children's school performance (Gottfried & Kirksey, 2017). Third, we looked at two school cohorts in the final year of compulsory secondary schooling in 2007 and 2008. While patterns of socioeconomic inequality in school absenteeism may look different in recent years, the general level of school absenteeism in Scotland appears to be very stable (Scottish Government, 2019). Fourth, compared to some US studies using administrative data (e.g., Gottfried, 2014; Morrissey et al., 2014), our sample size is also relatively small. Fifth, the official School Census and examination data from Scotland do not include information on private schools. Although private schooling only represents a small fraction of schooling in Scotland (4.1 percent in 2018, Scottish Council of Independent Schools, 2018), socioeconomic inequalities in school absenteeism may differ when including private schools in the sample.

Even though we have captured five different dimensions of socioeconomic background in our study, we may still underestimate the full scope of social inequality in school attendance. For instance, not all individuals considered economically disadvantaged live in social housing or register for free school meals. While family income or measures of poverty correlate with our dimensions, they may have unique associations with school absences that are not captured by these measures of socioeconomic background.

Despite the above limitations, the current findings have several *implications* for policymakers, practitioners, and researchers. First, there is a need for an explicit focus on narrowing the socioeconomic gap in absenteeism to close the inequality gap in educational and later life outcomes. Since absenteeism is detrimental to children's school performance (e.g., Gottfried, 2010; Ready, 2010), missing out on school is likely to be an important mechanism by which adolescents from lower socioeconomic backgrounds perform less well in school examinations than their more affluent peers (Morrissey et al., 2014). Besides educational attainment, school absenteeism also affects outcomes such as drug abuse (Hallfors et al., 2002) and employment opportunities (Alexander et al., 1997), resulting in a cycle of inequality in many life course domains. In other words, the differential risk of school absenteeism exacerbates the drivers of socioeconomic disparities in educational attainment and life course outcomes.

Second, considering the socioeconomic disadvantages and risk antecedents for different forms of absenteeism, improving families' socioeconomic conditions should be a key component of interventions to increase school attendance and reduce socioeconomic absenteeism gaps. Third, given the complex association between dimensions of socioeconomic background and school absenteeism among adolescents, there is a need for designing interventions tailored to subgroups and targeting specific socioeconomic risk indicators. This is because, as noted earlier, these indicators suggest different possible pathways to absenteeism. Such an intervention can be conceptualized within a multi-component intervention framework that combines personalized and whole-school interventions (Gee, 2018; Balfanz & Chang, 2016; Smythe-Leistico & Page, 2018).

Finally, more nuanced consideration should be given to socioeconomic background and school absenteeism measures since choices of operationalisation can influence the conclusions drawn (for similar argument see Dougherty, 2018). As a result, it would be worthwhile to reconsider policy decisions that are mainly driven by a single measure

of socioeconomic disadvantage. A case in point is an overreliance on the Scottish Index of Multiple Deprivation (SIMD) for decision-making in Scotland. While this neighborhood socioeconomic indicator is associated with school attendance, it is by far not the only dimension predicting absences from school. Making education policy solely based on area-level information will not affect many children growing up in adverse family circumstances who do not live in deprived areas. Efforts to tackle absenteeism should, therefore, consider disaggregating data using broader socioeconomic indicators.

While our study investigated associations between socioeconomic dimensions and different reasons for being absent, *future research* may be concerned with socioeconomic inequalities in the timing of absenteeism throughout the school year. It may be the case that children from lower socioeconomic backgrounds are more frequently missing out on school when it is most harmful to their educational careers. Future studies should also consider examining the specific pathways linking different socioeconomic indicators to varying reasons for school absence. This will provide insights into key mechanisms to guide interventions. Finally, our study was restricted to the final year of compulsory schooling. It would be illuminating to investigate the emergence of socioeconomic inequalities in school attendance throughout children's education.

5. Conclusion

Our study contributes new knowledge by showing that different dimensions of socioeconomic background are associated with adolescents' overall school attendance and different reasons for being absent from school. It advances the literature on absenteeism by examining the association between socioeconomic disadvantage and school absenteeism in greater nuances. The findings highlight how measurement decisions can influence key inferences relating to socioeconomic inequality in school absence, provide conceptual guidance for research on mechanisms underpinning socioeconomic inequalities in school absence, and policy and practice steps to reduce these inequalities.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2020.105432.

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